ABSTRACT OF THE DISCLOSURE

Signal wavelengths λ_1, λ_2, λ_3 of signal light components multiplexed at signal multiplexing sections 31, 41, 51 of multiplexing stations 3, 4, 5 installed on the input end side of an EDFA 2 on an optical transmission line 1 are set such that the wavelength-dependent noise figure of EDFA 2 successively decreases from the signal wavelength λ_1 multiplexed at the signal multiplexing section 31 closest to the input end of EDFA 2 to λ_2 and λ_3. On the other hand, the transmission length of individual signal light component before being fed into the EDFA 2 is the shortest in the signal light component at λ_1 and successively increases at λ_2 and λ_3. Thus, the order of magnitude of input signal light power is the same as the order of highness of noise figure in EDFA 2, whereby fluctuations in S/N ratio in the resulting amplified light are reduced.